IN THE CLAIMS

This listing of the claim will replace all prior versions and listings of claim in the present application.

Listing of Claims

Claim 1 (canceled).

2. (previously presented) The ATM communication apparatus according to claim 5, wherein said shared bandwidth assigner of said bandwidth controller comprises:

a bandwidth fair distributor for assigning the shared bandwidth based on the receiving bandwidth and the cell overflow situation supplied by said traffic supervisory unit; and

an upper-limit bandwidth limiter for limiting the upper-limit bandwidth based on the upper-limit bandwidth stored in the upper-limit bandwidth storage means.

3. (previously presented) The ATM communication apparatus according to claim 5, wherein said shared bandwidth storage means comprises a plurality of divided sub-shared bandwidth storage means and said shared bandwidth assigner further comprises a shared bandwidth selector for selecting any one out of a plurality of said sub-shared bandwidth storage means for each of said optical network units.

4. (previously presented) The ATM communication apparatus according to claim 5, further comprising an access bandwidth storage means for storing an access bandwidth which is made by adding the basic bandwidth and the shared bandwidth for each of said optical network units.

wherein said supervisory unit of cell overflow situation comprises a bandwidth comparator that compares the receiving bandwidth and the access bandwidth for each of said optical network units and judges the cell overflow situation.

5. (previously presented) An Asynchronous Transfer Mode (ATM) communication apparatus in a point-to-multipoint optical transfer system where the ATM communication apparatus is connected to a plurality of optical network units through an optical branching device, and the ATM communication apparatus, receives a multiplexed signal obtained when the optical branching device multiplexes optical signals transmitted by the optical network units, and branches an optical signal at the optical branching device to transmit to the optical network units, the ATM communication apparatus sends to each of the optical network units by using a certain area in an ATM cell, transmission timing and a transmission bandwidth of an ATM cell to be transmitted to the ATM communication apparatus to give an access right to control a communication bandwidth to perform ATM-cell receiving control in the optical transfer system, the ATM communication apparatus comprising:

a traffic supervisory unit for supervising a traffic situation of ATM cells sent to said ATM communication apparatus from the optical network units, the traffic supervisory unit having a supervisory unit of a receiving bandwidth for detecting the receiving bandwidth for receiving ATM cells from each of the optical network units and a supervisory unit of cell overflow situation for detecting a cell overflow situation of a sending buffer of ATM cells in each of the optical network units;

a bandwidth controller having a basic bandwidth assigner for assigning a basic bandwidth for sending ATM cells to each of the optical network units, an upper-limit bandwidth storage means for storing an upper-limit bandwidth set as upper-limit of bandwidth which is usable for transmission of ATM cells of each of said optical network units, a shared bandwidth assigner for assigning a shared bandwidth which is usable with the basic bandwidth to each of the optical network units according to value of the upper-limit bandwidth based on a receiving bandwidth and cell overflow situation that were supplied from said traffic supervisory unit, and the shared bandwidth storage means for storing the shared bandwidth assigned to each of the optical network units by said shared bandwidth; and

a generator of access permission for generating access permission to assign optical network units according to the shared bandwidth assigned by said shared bandwidth assignor,

wherein said supervisory unit of said cell overflow situation comprises an invalid cell detector that detects invalid cells received from each of said optical network units based on predetermined conditions and judges that the detected invalid cell is in the cell overflow situation in a case where the invalid cell was not detected by the optical network units.

6. (previously presented) The ATM communication apparatus according to claim 5, wherein said bandwidth controller assigns a plurality of the separate assignment bandwidths for one optical network unit to a plurality of the sub-shared bandwidths respectively.

7. (previously presented) The ATM communication apparatus according to claim 5, wherein said bandwidth controller assigns the shared bandwidth based on a predetermined priority for each of the sub-shared bandwidths.

8. (previously presented) The ATM communication apparatus according to claim 5, wherein said bandwidth controller provides a plurality of kinds of the basic bandwidths and assigns the shared bandwidth in proportion to each of the basic bandwidths.

9. (currently amended) The ATM communication apparatus according to claim ~~1~~5, wherein said bandwidth controller assigns one of the basic bandwidth and the shared bandwidth based on the contents of a plurality of subscriber contracts set for one optical network unit.

Claim 10 (canceled).

11. (previously presented) The bandwidth control method according to claim 14, wherein the shared bandwidth to be distributed is further divided into sub-shared bandwidths in distributing said shared bandwidth such that selection is made as to from which sub-shared bandwidth the distribution is performed on every optical network unit out of a plurality of the divided sub-shared bandwidths.

12. (previously presented) The bandwidth control method according to claim 14, wherein, for assigning the shared bandwidth to said any one of the optical network

units, the shared bandwidth is assigned to said any one of the optical network units with the rate of the upper-limit bandwidth of said any one of the optical network units to sum of the upper-limit bandwidth of said plurality of optical network units.

13. (previously presented) The bandwidth control method according to claim 14, wherein the receiving bandwidths of the effective cells, which were received from each of the optical network units, are compared to judge that the cell is in the overflow situation in the case where the judged access bandwidth and the receiving cell bandwidth of each of the optical network units are the same or approximate.

14. (previously presented) A bandwidth control method for controlling a bandwidth of Asynchronous Transfer Mode (ATM) cells received from each of a plurality of optical network units, in a point-to-multipoint optical transfer system where an ATM communication apparatus is connected to the optical network units through an optical branching device, and the ATM communication apparatus receives a multiplexed signal obtained when the optical branching device, multiplexes optical signals transmitted by the plurality of optical network units and branches an optical signal at the optical branching device to transmit to the optical network units, the ATM communication apparatus sends to each of the optical network units by using a certain area in an ATM cell, transmission timing and a transmission bandwidth of an ATM cell to be transmitted to the ATM communication apparatus to give an access right to control a communication bandwidth to perform ATM-cell receiving control in the point-to-multipoint optical transfer system, the bandwidth control method comprising:

dividing a transmission bandwidth, which said plurality of optical network units use for transmission of ATM cells, to a basic bandwidth and a shared bandwidth;

dividing the basic bandwidth and assigning it to said optical network units;

setting a upper-limit bandwidth which represents an usable maximum bandwidth to each of said optical network units;

supervising traffic situation of ATM cells received from any one of the optical network units, and detecting receiving bandwidth status which represents a bandwidth used by said any one of the optical network units;

comparing the detected receiving bandwidth status and a bandwidth which is set as an usable area to said any of optical network units and judging whether a wider bandwidth than the bandwidth which is set to said any one of the optical network units is need or not;

where it is judged that the wider bandwidth than the bandwidth which is set to said any one of the optical network units is needed, assigning a shared bandwidth, with an amount according to the upper-limit bandwidth set to said any one of the optical network units within the shared bandwidth, to said any one of the optical network units;

where sum of the basic bandwidth of said any one of the optical network units and the assigned shared bandwidth does not exceed the upper-limit bandwidth, setting the sum as a bandwidth usable by said any one of the optical network units, and, where the sum exceed the upper-limit bandwidth, setting the upper-limit bandwidth as a bandwidth usable by said any one of the optical network units; and

issuing access permission to said any one of the optical network units according to the bandwidth set to be usable by said any one of the optical network units,

wherein an invalid cell as determined based on predefined conditions received from any of the optical network units is detected to judge that the detected invalid cell is in

the overflow situation in a case where the invalid cell was not detected by the optical network unit.

15. (previously presented) The bandwidth control method according to claim 14, wherein a plurality of the separate assignment bandwidths for one optical network unit are assigned to a plurality of the sub-shared bandwidths respectively.

16. (previously presented) The bandwidth control method according to claim 14, wherein the shared bandwidth is assigned based on a predetermined priority for each of the sub-shared bandwidths respectively.

17. (previously presented) The bandwidth control method according to claim 14, wherein a plurality of kinds of the basic bandwidths are provided to assign the shared bandwidth in proportion to each of the basic bandwidths respectively.

18. (previously presented) The bandwidth control method according to claim 14, wherein one of the basic bandwidth and the shared bandwidth is assigned based on the contents of a plurality of subscriber contracts set for one optical network unit.